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Referral Directory Functional Description

AD-A215 000

Jonathan Krueger
(Control Data Corporation)

Carol Jacobson
(Defense Technical Information Center)

18 September 1989



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19. ABSTRACT (Continue on reverse if necessary and identify by block number) A functional description of DTIC's Referral Directory is an online index to activities such as specialized libraries, testing facilities, repositories, laboratories, information centers and research facilities. It leads users to activities appropriate to their needs. The functional description is organized according to the DLA ADS Life Cycle Management Specifications. Narrative and graphic descriptions of both the existing Referral Data Bank and the proposed Referral Directory are included.					
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DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
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Distribution/	
Availability Codes	
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TABLE OF CONTENTS

		Page
SECTION	1 GENERAL	1
	1.1 Purpose of Functional Description	1
	1.2 Project References	1
	1.3 Terms and Abbreviations	2
SECTION	2 SYSTEM SUMMARY	5
	2.1 Background	5
	2.2 Objectives	5
	2.3 Existing Methods and Procedures	6
	2.3.1 Referral Services Provided by DTIC-FDR	6
	2.3.2 Input of Referral Citations	6
	2.3.3 Output of Referral Citations	8
	2.4 Proposed Methods and Procedure	8
	2.4.1 Referral Services	8
	2.4.2 Input of Referral Citations	8
	2.4.3 Output of Referral Citations	10
	2.4.4 Summary of Improvements	10
	2.4.5 Summary of Impacts	12
	2.5 Assumptions and Constraints	12
SECTION	3 DETAILED CHARACTERISTICS	14
	3.1 Specific Performance Requirements	14
	3.1.1 Accuracy and Validity	14
	3.1.2 Timing	14
	3.2 Functional Area System Functions	14
	3.3 Inputs-Outputs	14
	3.3.1 Inputs	14
	3.3.2 Outputs	15
	3.4 Data Characteristics	15
	3.5 Failure Contingencies	18
	3.6 Security	18
SECTION	4 DESIGN DETAILS	19
	4.1 System Description	19
	4.2 System Functions	19
	4.2.1 Input/Editing System	19
	4.2.2 Retrieval System	20
	4.2.3 TR Database Tape Generation	22
	4.2.4 Hardcopy Referral Data Bank Directory Generation ..	22
	4.2.5 Accuracy and Validity	22
	4.2.6 Timing	24
	4.3 Flexibility	24
SECTION	5 ENVIRONMENT	25
	5.1 Equipment Environment	25
	5.2 Support Software Environment	25
	5.3 Interface	25
	5.4 Summary of Impacts	25

		Page
5.4.1	ADP Organization Impacts -----	25
5.4.2	ADP Operational Impacts -----	25
5.4.3	ADP Development Impacts -----	26
5.5	Failure Contingencies -----	26
5.6	Security -----	26
5.7	Assumptions and Constraints -----	26
SECTION 6	COST FACTORS -----	27
SECTION 7	SYSTEM DEVELOPMENT PLAN -----	28
APPENDICES:	-----	29
A.	Project Implementation Plan for the DoD Gateway Information System (DGIS) Directory of Resources -----	31
B.	Standard Operating Procedures for Referral Data Bank Output -----	37
C.	Standard Operating Procedures for Referral Data Bank Input -----	41
D.	Letter of Solicitation to Potential Referral Activities --	47
E.	Referral Data Work Sheet -----	51
F.	Referral Questionnaire (Example) -----	55
G.	TR Database Fields used by Referral Activities -----	61

LIST OF FIGURES

		Page
Figure	1 Referral Services Provided by DTIC-FDR -----	7
	2 Current Input Procedures for Referral Data Bank -----	7
	3 Current Retrieval Procedures for Referral Data Bank -----	9
	4 Current Procedures for Generation of Hardcopy Referral Data -----	9
	5 Input Procedures for Referral Directory -----	11
	6 Retrieval Procedures for Referral Directory -----	21
	7 Procedures for Generation of Hardcopy Referral Directory --	23

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SECTION 1. GENERAL

1.1 PURPOSE OF FUNCTIONAL DESCRIPTION

This Functional Description for the Referral Directory is written to provide the following:

- a. The system requirements to be satisfied, which will serve as a basis for mutual understanding between the user and the developer.
- b. Information on performance requirements, preliminary design, and user impacts, including fixed and continuing costs.
- c. A basis for the development of system test.

The user organization will consist of Defense Technical Information Center (DTIC) subscribers.

This document is intended to give an overview of the Referral Directory. This document is organized according to the DLA ADS Life Cycle Management Specifications, with the sections of the standards document corresponding to the sections of this document. In instances where sufficient information is not available, greater detail will be provided by the Referral Directory System Specification.

1.2 PROJECT REFERENCES

The general nature of the programs to be developed is *information retrieval, database management, and information resources management*. The project may be identified as follows:

Project Title:	Referral Directory
Project Sponsor:	Defense Technical Information Center, Office of Information Systems and Technology
Project Officer:	Carol Jacobson
Project User:	DGIS subscribers
Operating Center:	Defense Technical Information Center (DTIC)

Relevant references include:

- a. *Abstracting and Indexing Guidelines*. DTIC. January 1989.
- b. *Defense Technical Information Center Cataloging Guidelines*. DTIC. DTIC/TR-88/1. AD-A211 000. April 1988.
- c. *Defense Technical Information Center Referral Data Bank Directory*, 9th Ed. DTIC. AD-A138 400. February 1984.
- d. *Directory of DoD-Sponsored R&D Databases*. DTIC. AD-B116 400. February 1988.
- e. *Document Data Worksheet*, DTIC. DTIC Form 41. March 1980.

f. DoD Gateway Information System (DGIS) Directory of Resources Project Implementation Plan. DTIC/CDC. December 1988.

g. DoD Gateway Information System (DGIS) Directory of Resources Project Implementation Plan. DTIC/CDC. June 1989.

h. *DTIC Retrieval and Indexing Terminology*, 3rd Ed. DTIC. January 1987.

i. DTIC-DDR Letter, dated 13 July 1984, subject: DTIC Referral Data Bank Directory.

j. Referral Data Bank, Referral Input, Standard Operating Procedures. DTIC. 10 September 1984.

k. Referral Data Bank, Referral Output, Standard Operating Procedures. DTIC. 18 July 1984.

l. Referral Data Worksheet, DTIC. DTIC Form 91. October 1985.

1.3 TERMS AND ABBREVIATIONS

Term	Definition
Accession number	The AD number is composed of a transaction type prefix and a uniquely assigned serial number for ADP and document processing and control.
AD	Accessioned Document; designates a DTIC document such as a Technical Report. An AD number is uniquely assigned to each DTIC document.
ADP	Automated Data Processing.
ARPAnet	Advanced Research Projects Administration network.
ASCII	American Standard Code for Information Interchange; a computer coding system used to represent the alphabetic, numerical, and punctuation characters.
AUTOVON	Automatic Voice Network; dedicated phone system for federal government.
BASIS	A text database management system.
C	A programming language; will be compliant with the standard defined by Kernighan and Ritchie (1978) or higher.
DDN	Defense Data Network.
DGIS	DoD Gateway Information System.
DRIT	DTIC Retrieval and Indexing Terminology; technical thesaurus providing controlled vocabulary for indexing subject material of interest to the DoD community.
DROLS	Defense RDT&E Online System.
DTIC	Defense Technical Information Center.
DTIC-BLD	Network Services Branch
DTIC-FDRA	Reference Services Section

DTIC-FDR	Reference Services Branch
DTIC-HAR	Retrieval Analysis Branch
DTIC-HD	Database Management Division
DTIC-HDB	Bibliographic Database Branch
DTIC-HDS	Database Support Branch
DTIC-Z	Telecommunications & ADP Systems
FAX	Facsimile transmission machine. System for sending facsimile copies of documents to remote printers; digitizes page images, transmits via modem over ordinary voice grade phone lines. FAX number usually refers to the phone line connected to FAX equipment set up to receive the facsimile.
FTS	Federal Telecommunications System
FIPS	Federal Information Processing Standard; standard for ADP equipment procured by the federal government.
GOSIP	Government Open Systems Interconnection Protocols; proposed FIPS for sharing computer resources with and from a network of computers, based on the Open Systems Interconnect (OSI) model developed by the International Standards Institute (ISO).
IAC	Information Analysis Center; a specific type of Referral.
INGRES	A relational database management system supplied by Relational Technology Incorporated.
IRM	Information Resource Management.
OS	Operating system.
RDBMS	Relational Database Management System.
RDT&E	Research, Development, Test and Evaluation.
Referral	Any activity in the Referral Directory, typically an organization such as a library, information analysis center, or test center.
Referral Data Bank	Listing of Referral activities; maintained by DTIC.
Referral Data Bank Directory	Hardcopy directory of Referral activities; generated by DTIC from its listings; distributed by DTIC to users.
Referral Directory	Online database of Referral activities; available for retrieval and display through DGIS.
Referral Number	Uniquely identifies each Referral in the Referral Directory
RTIS	Remote Terminal Input System
TCP/IP	Transmission Control Protocol/Internet Protocol; standard for reliable data transmission across networks to heterogeneous applications and operating

systems.

termcap	Terminal capabilities database: file describing capabilities of different VDT devices and how to use them.
TR	Technical Report.
TRIS	Technical Report Input System, computer program maintained by DTIC.
VDT	Video Display Terminal, data terminal using Cathode Ray Tube (CRT) or LCD (Liquid Crystal Diode) technology to display characters or images, with unlimited refresh capabilities.

SECTION 2. SYSTEM SUMMARY

2.1 BACKGROUND

The centralized referral service began at DTIC in the early 1960's. The Referral Data Bank currently resides on DTIC's UNISYS 1100/82 computer as part of the Technical Reports (TR) database. These records are not displayable online but can be displayed offline if the user requests a print of the search results. Referral records can also appear in demand bibliographies if requested by the user. A hard copy directory is generated from the Referral Data Bank.

The DoD Gateway Information System (DGIS) became operational in 1986. DGIS is an information system that allows scientists, engineers and information specialists to take greater advantage of the wealth of information resources available on a wide variety of bibliographic and other online databases. DGIS supports connection to remote databases, assisted searching of multiple databases, online document ordering system, electronic mail and bibliographic post-processing.

DGIS offers a directory service to inform users about the different information resources available. This is known as the DGIS Directory of Resources (hereafter the Directory of Resources). The Directory of Resources is intended to help users locate sources of information relevant to their needs. It supports the DTIC mission of avoiding duplication of RDT&E efforts.

There are three components of the Directory of Resources: databases, information centers and people. All components will be made available in an integrated manner that supports a consistent interface, provides access to information resources and collects references in a convenient format. The Project Implementation Plan (Appendix A) documents the background and current development of the Directory of Resources.

The Directory of Databases is an online index to databases of interest to the DoD community. It contains descriptions of DoD-sponsored databases as well as other federal databases and commercial databases of interest to DoD. An interactive interface allows users to search the Directory and display the results at their terminals. The current interface was designed in July 1987 and implemented in October 1988. It is available for production use at this time. The *Directory of DoD-sponsored R&D Databases* (Reference 1.2.d) is produced from the database portion of the Directory of Resources.

The Referral portion of the Directory of Resources (hereafter the Referral Directory) is an online index to activities such as specialized libraries, repositories, laboratories, testing facilities, information centers and research facilities. It leads users to activities appropriate to their needs. This functional specification describes capabilities of the Referral Directory.

The people portion of the Directory of Resources is a planned component not under development at this time. It will cover individuals with particular expertise in various fields and subject areas.

The Referral Directory will allow online searching and display of activities of interest to the DoD information community. It will be made available as part of the Directory of Resources on the DoD Gateway Information System. It has been approved for design and development by the Defense Technical Information Center's Office of Information Systems and Technology.

2.2 OBJECTIVES

The major goals of the Referral Directory are as follows:

- a. To provide information on specialized libraries, repositories, laboratories, testing facilities, information centers and research facilities in a timely manner.
- b. To provide a system which an end user will be able to use.
- c. To provide a system which facilitates the online display of Referral records.
- d. To make the Referral Directory available online, via a friendly interface, as part of the Directory of Resources.

2.3 EXISTING METHODS AND PROCEDURES

DTIC referral services consist of responding to telephone and written inquiries, providing a data bank of Referral citations, printing and distributing a directory of these citations, and providing offline bibliographies with references to Referrals (Appendix B).

2.3.1 Referral Services Provided by DTIC Reference Services Branch (DTIC-FDR)

DTIC users contact DTIC Reference Services Section (DTIC-FDRA) with questions which may require a referral. Using the hard copy Referral Data Bank Directory, DTIC-FDRA directs the user to the specialized information center or research facility appropriate to his/her needs. The user is given information such as the name and address of the Referral organization and telephone numbers for the points of contact. This process is diagrammed in Figure 1.

2.3.2 Input of Referral Citations

DTIC-FDR is responsible for gathering information about Referrals and cataloging, indexing, and editing the information. Initially, DTIC-FDR staff review the literature and other sources such as technical reports, project references, directories, promotional brochures, etc., for potential Referrals (Appendix C). Each potential Referral is sent a letter (Appendix D) and a DDC Form 91 (Appendix E) to complete and return to DTIC. This process is performed throughout the year. Every 2 to 3 years, existing Referrals are sent copies of their records to validate, update, and return to DTIC for inclusion in the next edition of the hardcopy *Defense Technical Information Center Referral Data Bank Directory* (Reference 1.2.c).

The returned forms are compiled and edited by DTIC-FDR. It is frequently necessary to contact the Referral activity by telephone to obtain clarifications and assure consistency in content and format. Each new Referral is assigned an AD number and index terms by a DTIC-FDR staff member. The DRIT (Reference 1.2.h) and the *Abstracting and Indexing Guidelines* (Reference 1.2.a) are used in the selection and assignment of primary (weighted) and secondary terms. DTIC Bibliographic Database Branch (DTIC-HDB) is responsible for assigning source codes for Referrals, where necessary. DTIC-HDB staff follow the rules outlined in the *Defense Technical Information Center Cataloging Guidelines* (Reference 1.2.b) in assigning source codes.

DTIC Database Support Branch (DTIC-HDS) staff enter Referral citations into an RTIS file on the UNISYS 1100/82. This file is made available to the Current File and validated by TRIS on a nightly basis. Valid records are marked as candidates for update to the TR Database. DTIC-FDR receives printouts of the results of the validations with errors flagged on a nightly basis. Records containing errors are manually corrected by DTIC-FDR and the corrections are sent to the Database Support Branch (DTIC-HDS) for entry into the RTIS file and subsequent validation. Every 2 weeks candidates for update are entered into the TR Database and removed from the Current File. This process is described in Figure 2.

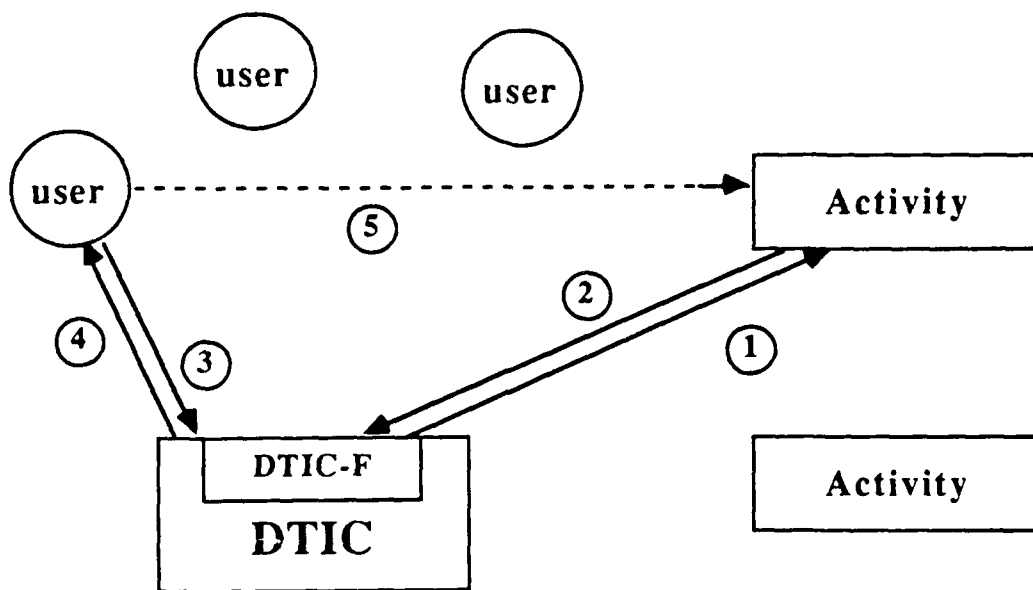


Figure 1. Referral Services Provided by DTIC-FDR.

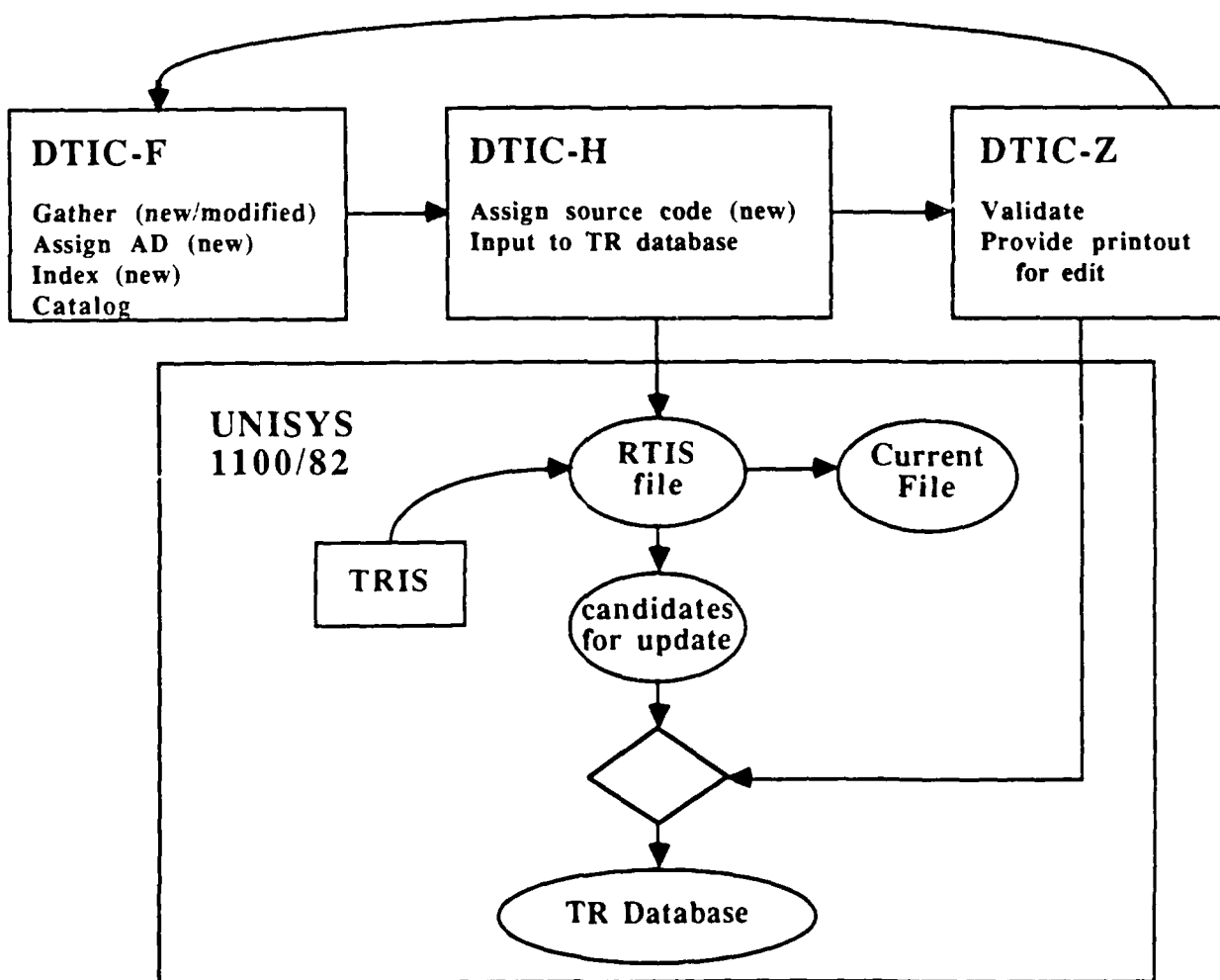


Figure 2. Current Input Procedures for Referral Data Bank.

2.3.3 Output of Referral Citations

Referral citations can be retrieved as part of an online search of the TR Database and/or the Current File, but these citations are not displayable online. They are displayable through an offline print. Offline prints are either user generated or DTIC-generated (when a user requests that DTIC Retrieval Analysis Branch (DTIC-HAR) staff perform the search and prepare an offline print of the search results [i.e., prepare a demand bibliography]). This process is diagrammed in Figure 3.

Referral citations also appear in the hardcopy/microform publication, *Defense Technical Information Center Referral Data Bank Directory*. The last edition of the hard copy Directory was generated by the Directorate of Telecommunications and Information Systems (DTIC-Z) and DTIC-FDR in February 1984 (Reference 1.2.c). The Referral Data Bank Directory was produced by copying Referral citations from the TR Database onto magnetic tape and loading the tape onto the UNISYS 1100/62 computer where the Referral citations were input to a BASIS database. The BASIS report writer was used to generate the individual Referral citations as well as the organization name, subject, and point of contact indexes. The indexes were printed on the Xerox 9700. The Report Documentation Page, Preface, Table of Contents, and listing of the Department of Defense Information Analysis Centers were produced on the Lanier, a standalone word processor. DTIC-FDR combined the output from the Xerox 9700 with the output from the Lanier to produce the camera ready copy of the Referral Data Bank Directory, and it was submitted for printing. This process is described in Figure 4.

2.4 PROPOSED METHODS AND PROCEDURES

2.4.1 Referral Services

DTIC referral services will consist of responding to telephone and written inquiries, providing a data bank of Referral citations, printing and distributing a directory of these citations, and providing offline bibliographies with references to Referrals. In addition, Referral citations will be displayable online as part of the DGIS Directory of Resources.

2.4.2 Input of Referral Citations

The procedures for gathering, collecting and indexing Referral information will not change. DTIC-FDR will be responsible for gathering information about Referrals and cataloging, indexing, and editing the information. Initially, DTIC-FDR staff will review the literature and other sources such as technical reports, project references, directories, promotional brochures, etc. for potential Referrals. DTIC-FDR will send a letter (Appendix D) and a DDC Form 91 (Appendix E) or equivalent (Appendix F) to complete and return to DTIC. This process will be performed throughout the year. Every year, existing Referrals will be sent copies of their records to validate, update and return to DTIC for inclusion in the next edition of the hardcopy *Defense Technical Information Center Referral Data Bank Directory*.

The returned forms will be compiled and edited by DTIC-FDR. DTIC-FDR will contact the Referral activity by telephone when necessary to obtain clarifications and assure consistency in content and format. DTIC-FDR will assign each new Referral an AD number and index terms. The DRIT (Reference 1.2.h) and the *Abstracting and Indexing Guidelines* (Reference 1.2.a) will be used in the selection and assignment of primary (weighted) and secondary terms. DTIC-HDB will be responsible for assigning source codes for Referrals, where necessary. DTIC-HDB staff will follow the rules outlined in the *Defense Technical Information Center Cataloging Guidelines* (Reference 1.2.b) in assigning source codes.

DTIC-HDS staff will enter Referral citations into the Referral Directory on the DGIS computer. Entries will be validated by the INGRES-based online input/editing system (see Section 3.3, Inputs-Outputs). DTIC-FDR staff will use the online input/editing system to review new and existing

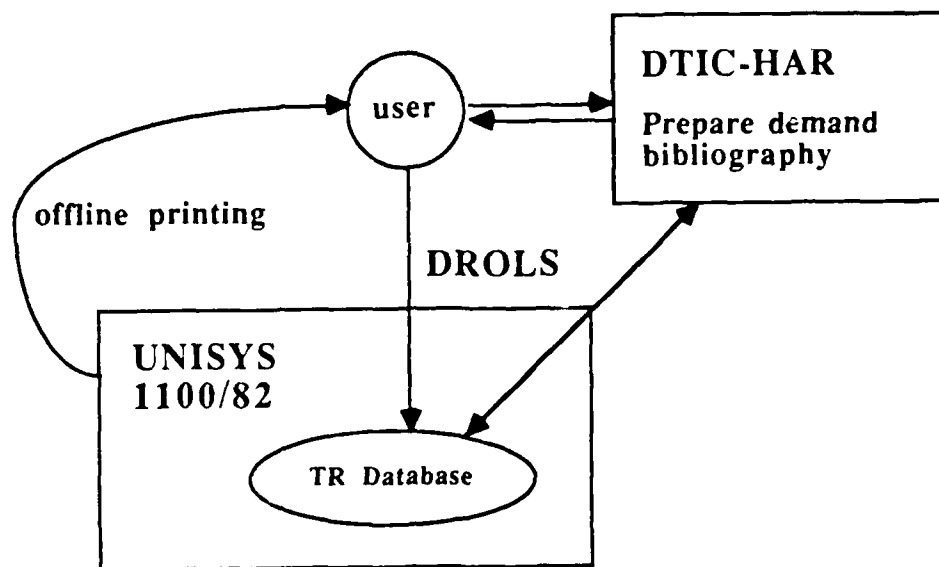


Figure 3. Current Retrieval Procedures for Referral Data Bank.

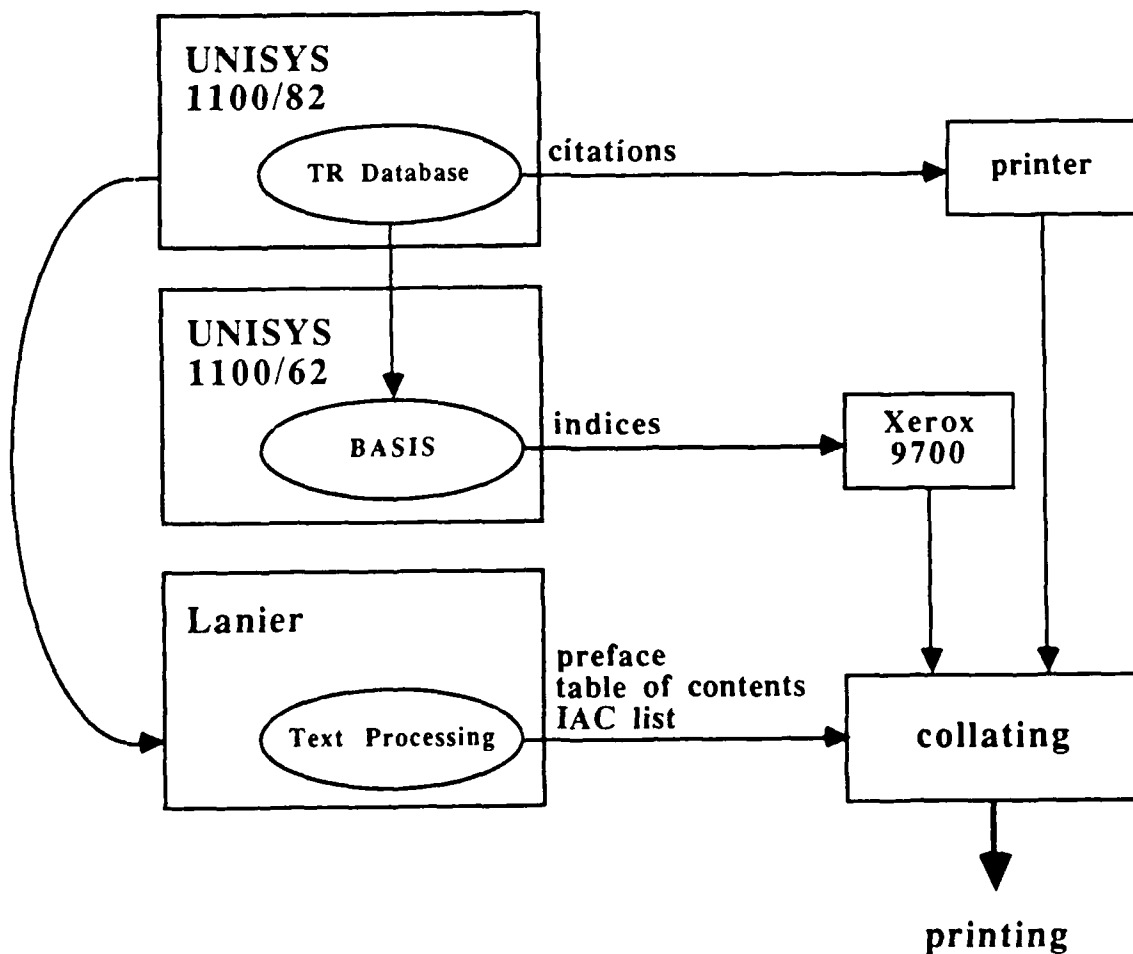


Figure 4. Current Procedures for Generation of Hardcopy Referral Data.

records and to generate hardcopy prints of individual records. Every 2 weeks the Referral Directory will generate a tape containing all new Referral records in a format suitable for input to an RTIS file on the UNISYS 1100/82. The nightly TRIS validation will check the records, flag any errors and mark candidates for update to the TR Database. Candidates for update will be entered into the TR Database. This process is described in Figure 5.

2.4.3 Output of Referral Citations

With the implementation of the Referral Directory, citations will be displayable online on the DGIS computer. The Referral Directory will allow searches by activity name, point of contact, or the full text of the index terms and annotation. Referral citations retrieved by the Referral Directory will be available for immediate display on the user's terminal. Different display formats providing varying amounts of detail will be provided.

Referral citations will continue to be retrievable but not displayable as part of online searches of the TR Database and/or the Current File. Referral citations in the TR Database and/or Current File will be displayable via an offline print. Offline prints from the TR Database and/or the Current File will be either user-generated or DTIC-generated. A DTIC-generated request occurs when a user requests that DTIC-HAR staff perform the search and prepare an offline print of the search results (i.e., prepare a demand bibliography).

Referral citations also appear in the hardcopy/microform publication, *Defense Technical Information Center Referral Data Bank Directory*. This publication will be generated by electronic publishing software resident on the DGIS computer, including INGRES Report writer, UNIX 'sed' and 'awk' text processing filters, and 'nroff/troff' digital typesetting utilities. The hardcopy generation procedures will generate a complete, camera ready hardcopy directly from the current contents of the Referral Directory. The procedures will generate the individual Referral records, indices, IAC list and table of contents in an automated manner. The person preparing the preface will enter appropriate text and pagination for the front matter.

2.4.4 Summary of Improvements

The following benefits will be obtained from the proposed Referral Directory:

- a. The Referral Directory will provide rapid and easy retrieval of relevant information for users.
- b. The Referral Directory will provide data entry personnel with a user friendly interface for inputting, editing and validating data.
- c. The availability of the Referral Directory will not be hindered by non-working hours. The system is expected to support almost 24-hour availability.
- d. Users will have access to an online information retrieval system with online display capabilities in addition to the current paper document and hard copy bibliographies.
- e. Speed of delivery of Referral information will improve because turnaround time for display of Referral records will decrease.
- f. The system will be available for remote, concurrent access. Users in different places will access the system at different times or at the same time, without locking each other out or even being aware of each other's use. Network, internetwork and gateway access will also be provided.
- g. New kinds of searches will become possible. For example, search by subject will perform a full text search on any word located anywhere within the descriptors or the annotation. The flexibility of the system and responsiveness to its users will be enhanced.

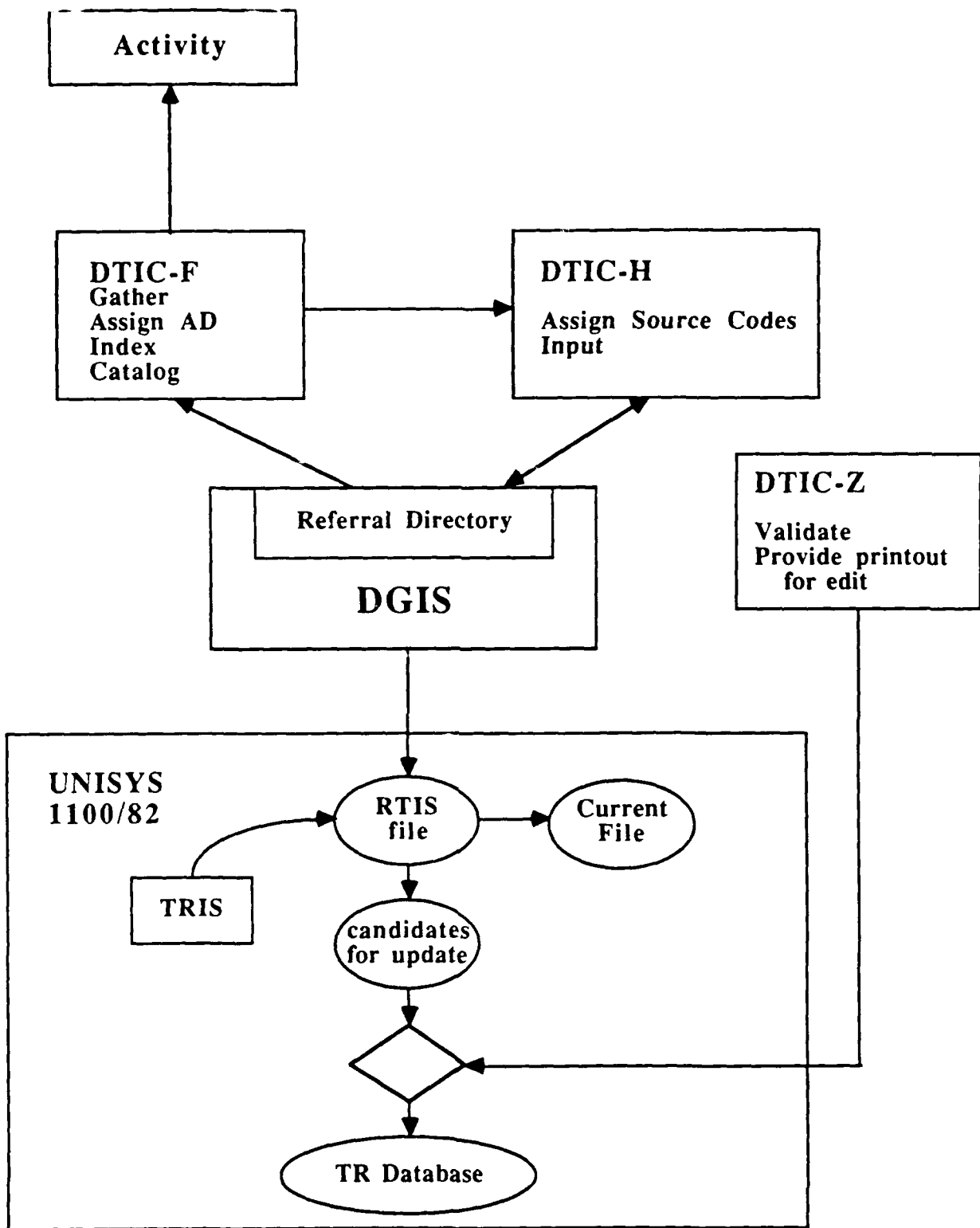


Figure 5. Input Procedures for Referral Directory.

h. The quality of hardcopy Directory will be improved, from lineprinter to near-typeset, through the use of electronic publishing tools and a laser printer.

i. The hardcopy generation procedures will facilitate/streamline production of the hardcopy Referral Data Bank Directory.

2.4.5 Summary of Impacts

The proposed Referral Directory is expected to have the following impacts:

2.4.5.1 User Organization Impacts

Current DTIC staff working on the Referral Directory will maintain the same responsibilities. Once the product is operational, it will be turned over to DTIC-FDR and DTIC-Z for program management and operation/maintenance, respectively. DTIC-HDS will perform input services. DTIC-HDB will provide source codes. DTIC-HAR will perform retrieval services.

2.4.5.2 User Operational Impacts

Training for the input, editing and retrieval system on the DGIS computer will be provided to DTIC staff by contract. When the system becomes operational, retrieval training will be provided by DTIC Network Services Branch (DTIC-BLD). User operations on the UNISYS computer will remain the same.

The Referral Directory will execute on the DGIS computer as part of a mixed workload including the Directory of Databases, communications to remote hosts and bibliographic post-processing. Loads generated by individual Referral Directory users are not anticipated to be high. The total load of all Referral Directory users, in combination with loads generated by other DGIS users, will be monitored and measured using simulation testing if necessary. Configuration management will be provided to evaluate resources needed and used by the Referral Directory on the DGIS computer.

2.4.5.3 User Development Impacts

Current user development on the UNISYS computer will not be affected. Training for the user will be provided on the input, editing and retrieval system on the DGIS computer. It is anticipated that a wider user base will follow the general availability of the online system. This may make additional DGIS hardware resources appropriate.

2.5 ASSUMPTIONS AND CONSTRAINTS

It is assumed that:

a. The Referral Directory will be developed and maintained on the Pyramid 98x using Berkeley UNIX (OSx 4.4 or above) as an operating system, or that an equivalent Berkeley UNIX processor (4.2 BSD or above) will be provided for this purpose. For more specifics on the hardware environment, see Section 5.1, Equipment Environment.

b. Adequate equipment resources will be made available. Effective development will require at least 50 megabytes of disk space for sources, objects, images, forms, data, indices and archives, and load averages of under 5 points of load on the Pyramid 98x.

c. A licensed copy of RTI INGRES, version 5.0 or higher, will be made available on the development machine (Pyramid 98x or equivalent) to implement the Referral Directory. A reliable and current installation will be maintained by a local site representative. RTI software support services will be made available.

- d. The programming language "C" will be made available on the development machine.
- e. The data will be made available to the DGIS computer in ASCII format.
- f. The data will be made available to the UNISYS computer on magnetic tape at 1600 or 6250 bytes per inch (bpi).

SECTION 3. DETAILED CHARACTERISTICS

3.1 SPECIFIC PERFORMANCE REQUIREMENTS

The Referral Directory will return information and update data to its users in a timely and accurate fashion.

3.1.1 Accuracy and Validity

The same accuracy requirements utilized for the entry of Referral citations into the TR database and for the production of the *Defense Technical Information Center Referral Data Bank Directory* will be applied to the Referral Directory and hard/microfiche copy Directory. These requirements are documented at length in the Cataloging Guidelines (Reference 1.2.b.), and in Section 3.4, Data Characteristics.

3.1.2 Timing

Response time for input of data, update of the database and queries of the Directory will vary from a few seconds to a few minutes. Response time is also dependent on machine load. A response should appear within a few seconds under an expected average machine load. This performance is insensitive to number of records, field lengths and record lengths, and it will not degrade sharply with incremental changes in the same.

3.2 FUNCTIONAL AREA SYSTEM FUNCTIONS

The system will consist of 5 functional components: the database itself, an online input/editing system to maintain it, an automated procedure to generate a tape to export Referral citations to the TR database, an automated procedure to generate the hardcopy Referral Data Bank Directory, and a user-friendly retrieval system that allows searching and online display of Referral citations. The requirements specified in Section 3.1, Specific Performance Requirements, will be used in the selection of hardware and software to support the Referral Directory. More details on this topic will be found in the System Specification.

3.3 INPUTS-OUTPUTS

3.3.1 Inputs

Data will be input by DTIC-HDS staff using the online editing systems available in the Referral Directory on the DGIS computer. They may use any Video Display Terminals (VDT) capable of ASCII asynchronous transmission and cursor positioning.

All data elements listed under data characteristics may be input or updated at any time. Any data element is accessible for searching and editing. Data integrity is maintained by validations defined for each data element. These validations are enforced by the database management system itself and made more explicit by the online input and editing systems. In addition, permissions will be set on who can input and who can edit data.

Two data elements are special: accession number and date of last update. They are treated differently by software that controls input and editing of Referrals.

The accession number is the primary key for all tables in the database. Therefore it cannot be changed once assigned. Once an accession number has been assigned to a Referral, it cannot be used by another Referral, it cannot be reused, and it cannot be modified. This enforces the integrity that when a Referral changes its name, it remains the same activity and retains its correct listing in the Directory.

The date of last update is assigned by the input and editing software. Inputters do not supply it and cannot change it. It is set automatically to the current date when a Referral is updated.

3.3.2 Outputs

Output of data from the Referral Directory will be directed to the user's VDT. Users may use any VDT capable of ASCII asynchronous transmission and cursor positioning. Three levels of detail will be available to users. The short format will show the Referral activity name, address, point-of-contact, and phone numbers. The medium level of detail will display the Referral name, address, point-of-contact, descriptors and annotation. The full display will show the complete citation, all information listed about the activity in the Referral Directory. No data may be modified by the user.

A specific set of outputs will be copied to the tape used to update the Technical Report (TR) Database.

3.4 DATA CHARACTERISTICS

Data elements are described by name, type, function, validations and, when applicable, relationships to other data elements:

Referral number

Integer: the primary key. Example: 991491. It uniquely identifies each Referral. This is a required field; the input system will not allow entry of a new Referral without a referral number. Permissible key values are positive integers of exactly six decimal digits. For TR input, the characters "AD" will be prepended to form an AD number of total length 8 characters. Input of new Referrals into the Referral Directory will not require entry of the "AD", however, and it will not be stored in the Referral Directory database. Validations: must be a unique number (not already assigned to another Referral) of 990000 or greater.

Name

Text: The name of the Referral activity. Example: US Geological Survey, Library. Can be up to 116 alphabetic characters, the TR format limit. This is a required field; the input system will not allow entry of a new Referral without an activity name. Validations: none, although the possibility of using the Corporate Source Header List, keyed through the source code, as a name authority file should be considered.

Address

Text: The address of the Referral activity. Example: National Center, MS950, 12201 Sunrise Valley Drive, Reston, VA 22092. Can be up to 130 alphanumeric characters. This may be expanded, but for TR input, total length including phone numbers cannot exceed 450 alphabetic characters. By convention, a vertical stroke (!) character separates lines for mailing labels. Input of new Referrals into the Referral Directory will require entry of the vertical stroke, and it will be stored in the database. For TR input, however, the vertical stroke will be omitted. Validations: none.

Commercial telephone

Text: The commercial telephone number of the Referral activity. Example: (703) 860-6671. Can be up to 15 alphanumeric characters. Includes area code, telephone number and extension. Will be input, stored, and output exactly as shown. Validations: none.

AUTOVON number

Text: The AUTOVON number of the Referral activity. Example: 473-7063. Can be up to 8 alphanumeric characters. Will be input, stored, and output exactly as shown. Validations: must be of form nnn-nnnn where n is a decimal digit.

FTS number

Text: The FTS number of the Referral activity. Example: 928-6671. Can be up to 8 alphanumeric characters. Will be input, stored, and output exactly as shown. Validations: none.

FAX number

Text: The telephone number of a FAX machine at the Referral activity. Example: 703-998-2700. Can be up to 15 alphanumeric characters. Includes area code and telephone number. Will be input, stored, and output exactly as shown. Validations: none.

Points of Contact

Text: Names and titles of persons who are points of contact for the Referral activity. Example: Chappell, B. A., Chief, Reference; Messick, C. H., Reference Librarian. Names can be up to 30 alphabetic characters, titles up to 25 alphanumeric characters. These lengths may be increased, but for TR input total length for each point of contact cannot exceed 120 characters. This is a detail table: this means that each Referral activity can list zero, one or many points of contact. However, for TR input, total length of all points of contact cannot exceed 620 alphabetic characters. In the data call, sources will not be solicited for more than 2 points of contact. Validations: none.

Date of last update

Date: The date that the Referral activity was last updated. Example: 850501. Will be set automatically to the date of inputting or editing the Referral. For TR input, will be formatted YYMMDD as shown. For output to Referral Data Bank Directory, will be formatted for ease of reading; for example, "May 1, 1985". Validations: limited to legal dates after 1 Jan 90.

Languages

Text: Languages the Referral activity supports in some way, such as collection or translation services. Example: German; Chinese. Each language can be up to 20 alphabetic characters. This is a detail table: each Referral activity can list zero, one or many languages. For TR input, total length cannot exceed 140 alphabetic characters. Only languages other than English are listed. Validations: valid languages are Chinese, Dutch, French, German, Italian, French, Russian, Spanish, Japanese. Other valid languages may be defined later.

Organization Type

Text: The function of this Referral activity. Example: Technical Library. Can be up to 30 alphabetic characters. This may be expanded, but for TR input, the length cannot exceed 35 characters. Validations: valid types are Academic Library, IAC, Library, Medical Library, Research Laboratory and Technical Library. Other valid types may be defined later.

Organization function

Text: The branch of service with which this Referral activity is affiliated. Example: Department of the Interior. Can be up to 20 alphabetic characters in length. This may be expanded, but for TR input, the length cannot exceed 35 characters. Validations: valid functions are Army, Navy, Air Force and DoD. Other valid functions may be defined later.

Collection

Integer and Text: The collection of resources available at this Referral activity. Example: 750,000 books, 340,000 microforms, 310,000 maps, and 270,000 pamphlets. Department of the Interior. Up to 30 alphanumeric characters for each type, up to 4 billion

(4,000,000,000) to indicate how many of that type. This is a detail table: each Referral activity may list zero, one or many collection types. For TR input, however, total length cannot exceed 600 characters. Validations: valid resources are books, classified materials, computer software, government reports, journals/serials/periodicals, maps, microforms, online systems, (BRS, DIALOG, DROLS, MEDLARS, ORBIT or others), phonograph records or audio tapes, photographs, scientific and technical data sets, technical reports, translations, unpublished materials and video cassettes. Other valid types may be defined later.

Descriptors

Text: Subject descriptors giving subjects for this Referral activity. Example: *Geology, *Mineralogy, *Topography, *Geochemistry, *Geophysics, *Paleontology, *Ground Water, *Surface Waters, *Minerals, *Hydrology, *Maps, *Mapping, *Petrography, *Photographs, *Earth Sciences, *Photography, *Water Resources, *Charts, Geodetic Surveys, Floods, Geological Survey. Can be up to 45 alphanumeric characters in length. Key words that describe material this organization will have, taken from the DRIT (Reference 1.b.h). This is a detail table: each Referral activity can have an unlimited number of descriptors. However, for TR input, total length cannot exceed 1200 characters. Some descriptors are weighted; each Referral activity can have an unlimited number of weighted descriptors. Validations: each Referral activity must have at least one weighted descriptor; each descriptor must be taken from the DRIT.

Services

Text: The types of services this Referral activity offers. Example: Referral, Reference, Loans (Interlibrary), Cartography. Up to 50 alphanumeric characters for each type. This is a detail table: each Referral activity may list zero, one or many services. However, for TR input, total length cannot exceed 1200 characters. Validations: valid services are bibliography compilation, consultant, data compilation, identification, literature searches, interlibrary loans, manual searches, online searches, reference Referral, state-of-the-art reviews, technical analysis and evaluation, and technical answers. Other valid types may be defined later.

Publications

Text: The names of specific printed journals, papers, newsletters or other items published by this Referral activity. Example: the second edition of Scintillation Spectrometry, Gamma-Ray Spectrum Catalogue, state-of-the-art reviews, and data compilations. up to 120 alphanumeric characters for each publication. This is a detail table: each Referral activity can list zero, one or many publications. However, for TR input, the total length cannot exceed 1800 characters. Validations: none.

Access and Charges

Text: Restrictions on who is permitted to access the collection or make use of this Referral activity and charges for use. Example: the Geological Survey library is open to the public. There is no charge for services other than photocopy. Its resources are made available to other government agencies, state geological surveys, academic institutions and research organizations. Can be up to 100 alphanumeric characters. This may be expanded, but for TR input, length cannot exceed 400 characters. No validations performed, but usually expected to be one of {DoD only, DoD and contractors, U.S. government only, U.S. government and contractors, no restrictions}, and a rate or list of fees and charges that may depend on type of user.

Coverage

Text: The period or the span of time of the material at hand. Example: 1944 to present. Can be up to 25 alphanumeric characters. No validations performed, but usually expected to be of the form "yyyy to present." This may be expanded, but for TR input, the length cannot exceed 32 characters.

Hours of Operation

Text: Regular hours of availability for the Referral activity. Example: 7:15am - 5:00pm EST, Monday-Friday. Can be up to 50 alphanumeric characters. Includes opening and closing hours and days of the week during which the facility is open. No validations performed but entries expected to be of this form.

Contract

Text: The contract number. Example: N01GM-2127. Can be up to 50 alphanumeric characters. This may be expanded, but for TR input, the length cannot exceed 70 characters. Validations: none.

Annotation

Text: A brief description of the activity, in free format. Example: The library supports the mission requirements of the Geological Survey scientists. Can be up to 1000 alphanumeric characters. This may be expanded; however, for TR input, only 450 characters can be represented. The Geological Survey is one of the federal government's major earth science research and factfinding agencies. The Survey also maintains large branch libraries at its regional offices and at other field locations, and a photographic library at its regional center in Denver. Validations: None.

The current Referral citations (without indexing) occupy 5 megabytes of disk storage. Due to queries, temporary tables, search tables and indices, another 5 megabytes may be expected for temporary storage.

3.5 FAILURE CONTINGENCIES

The data and programs for the Referral Directory will be backed up to tape periodically. The format will permit them to be read on other UNIX machines. A second INGRES license is maintained on a separate UNIX processor in the network. In the event of prolonged downtime on the host processor, the Referral Directory will be restored to that processor, and rebuilt using INGRES on that machine. A fallback system for the online Referral Directory is the hard copy Defense Technical Information Center Referral Data Bank Directory.

3.6 SECURITY

The Referral Directory will be an unclassified system.

SECTION 4. DESIGN DETAILS

4.1 SYSTEM DESCRIPTION

The system will consist of a set of general purpose software tools available in standard environments, applied to maintain the data characteristics (Section 3.4) and satisfy the functional requirements (Section 3.2). These tools will include those provided by the INGRES RDBMS, version 5.0 or above, and the Berkeley UNIX operating system, version 4.2 or above (Pyramid OSx 4.4 or above).

These tools will be used to build the five functional components of the Referral Directory: the database itself, an online input/editing system, TR Database tape generation, hardcopy *Defense Technical Information Center Referral Data Bank Directory* generation, and online retrieval system. The technical approach will include use of the INGRES tools to define the database, load existing data, write software to provide online input and editing, build a user-friendly retrieval system, maintain data consistency and integrity, and provide remote concurrent online access. UNIX tools will be used to format and filter existing data, generate tape output and special reports, provide communications services, and support documentation preparation and electronic publishing.

Specific tools resident on Berkeley UNIX may be enumerated as the "C" compiler, 'ld', 'lex', 'yacc', 'awk', 'sed', make, RCS, termcap/curses, 'nroff/troff' with the '-ms' (manuscript) macros, Adobe Transcript support for PostScript printers such as the Apple Laserwriter Plus, and GNU EMACS. Specific tools supplied by RTI with INGRES may be enumerated as embedded query language (EQUEL), embedded structured query language (ESQL), the Applications-by-Forms fourth-generation language (ABF), the forms runtime system, Query-by-Forms (QBF), Visual Forms Editor (VIFRED), INGRES/Net, and the QUEL and SQL terminal monitors.

4.2 SYSTEM FUNCTIONS

To deliver reliable, accurate and timely service to users of the Referral Directory, the data will be modeled in such a way as to guarantee the most integrity and deliver the most efficiency. For instance, one-to-one and one-to-many relationships will be defined and the data will be modelled accordingly. Database design will represent the data elements according to this model.

4.2.1 Input/Editing System

The input/editing system will provide online, interactive editing capabilities to maintain the Referral Directory. It will be accessible locally or remotely from standard ASCII VDT devices. It will provide a menu driven interface to guide the user through the process of entering and editing Referral citations. It will validate data inputs according to the rules and integrities defined in Section 3.4, Data Characteristics. It will update the Referral Directory immediately. New/updated Referral citations will be available to users of the Referral Directory retrieval system within seconds after they have been entered/updated.

New/updated Referral citations will be available to TR Database users not later than two weeks after they have been entered/updated. The Referral Directory will generate a tape for input to the UNISYS 1100/82. This will make Referral citations available to the TR Database and the Current File. The tape transfer procedure will be initiated manually, to coordinate with the tape mount, but will require no manual intervention after that point.

The input/editing system will provide a function to enable printing of an individual record for a Referral. This will provide hardcopy for proofreading after entry of new/updated Referral citations.

Once a year, a review copy of the entire Referral Directory will be generated. This is intended for use by DTIC Reference Service Branch (DTIC-FDR) and is separate from generation of the hardcopy Referral Data Bank Directory. It will differ from the hardcopy Referral Data Bank Directory in that it will not display page numbers, and it will print the date of last update for each record.

4.2.2 Retrieval System

The retrieval system will provide three types of searches, a browsing capability and a choice of displays. The retrieval system will provide a menu-based interface to this functionality. Each menu will offer a small, well-defined set of choices. Figure 6 provides a flowchart showing the menus in the retrieval system and their relationship to each other.

4.2.2.1 Retrieval system searches

The retrieval system will provide three types of searches: by referral name, by subject, and by points of contact.

4.2.2.1.1 Referral name search

A referral name query will initiate a search on the full text of the Referral activity name. It will generate a case, punctuation and order-insensitive search on all words in the activity name field. For instance, an activity named "White Sands Missile Range" would match a search for "Missile" or "missile range" or "WHITE SANDS." It would also match a search for "Missile Sands." A list of stop words will be used to filter out "noise" words. The list is currently: a, an, and, are, as, at, be, been, by, for, from, has, have, in, is, it, not, of, on, or, that, the, these, to, which.

4.2.2.1.2 Subject search

A subject query will initiate a search on the full text of the Annotation (see Section 3.4) and Descriptor fields. It will provide a case, punctuation and order-insensitive search on all words found anywhere within the Annotation and Descriptor fields. For instance, the annotation for the White Sands Missile Range includes the text "tests guided missile systems for the Army, Navy, Air Force, and other government agencies and contractors." The descriptors include Guided Missiles, Test Facilities, and Reliability (Electronics). This citation would match a search by subject for such subjects as "missile", "missiles", "test", "tests", "reliability", "electronics", "army", "navy", and so on. A list of stop words may be used to filter out "noise" words.

4.2.2.1.3 Point of Contact search

A point of contact query will initiate a case-insensitive search by the name of the point of contact.

4.2.2.2 Retrieval system browsing

Corresponding browse capabilities will be provided to each search capability. They will help the user to learn what activity names, points of contact names, and subject terms are available.

4.2.2.2.1 Referral name browse

A Referral Name browse will display names of Referral Activities on the user's VDT, one name per line. The user will be able to scroll forward and backward through the list. The user will tag names of individual Referrals via the menu interface. The user will then display the corresponding Referrals using the same 3 kinds of displays as for searches.

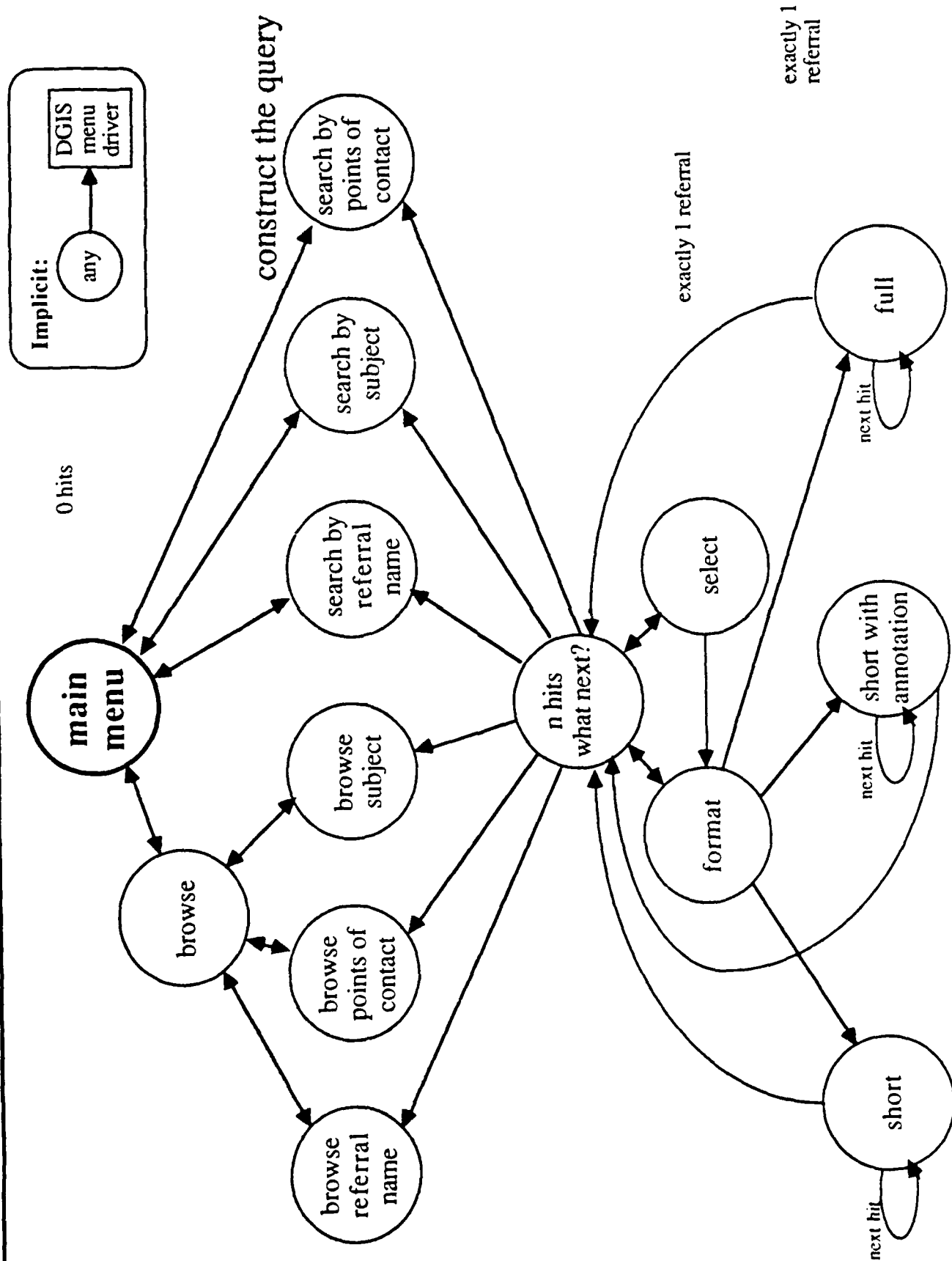


Figure 6. Retrieval Procedures for Referral Directory.

4.2.2.2.2 Subject browse

A Subject browse will display the words in the full text of the descriptors and the annotation. The user will be able to scroll forwards through the list. The user will tag individual words via the menu interface. The user will then display the corresponding Referrals using the same 3 kinds of displays as for searches.

4.2.2.2.3 Point of Contact browse

A Point of Contact browse will display the names of the points of contact. The user will be able to scroll forward and backward through the list. The user will tag names via the menu interface. The user will then display the corresponding Referrals using the same 3 kinds of displays as for searches.

4.2.2.3 Retrieval system display

The retrieved citations may be immediately displayed online in any of three formats: short, short with annotation, and full details.

4.2.2.3.1 Short display

The short format will show the Referral activity name, address, point-of-contact and phone numbers.

4.2.2.3.2 Short with annotation display

The medium level of detail will display the Referral name, address, points-of-contact, phone numbers, descriptors and annotation.

4.2.2.3.3 Full display

The full display will show the complete citation, i.e., all information listed about the activity in the Referral Directory.

4.2.3 TR Database Tape Generation

The generation of tapes to input Referral data into the TR Database and Current File will support existing interfaces. It will continue to be possible for DROLS users to request an offline print of search results which include Referral citations.

4.2.4 Hardcopy Referral Data Bank Directory Generation

The hardcopy generation procedures will generate a complete, camera ready hardcopy directly from the current contents of the Referral Directory. This will include a table of contents, preface, citation listings for each Referral activity, and indices. This process is diagrammed in Figure 7.

4.2.5 Accuracy and Validity

The same accuracy requirements used for the *Defense Technical Information Center Referral Data Bank Referral Directory* will be used for Referral Directory. These are listed in the *Defense Technical Information Center Cataloging Guidelines* (Reference 1.2.b) and in Section 3.1.1, Accuracy and Validity, and Section 3.4, Data Characteristics. These requirements will be implemented in the Input/Editing System. TRIS will validate all Referral citations input to the TR Database. INGRES integrities and forms validations will validate Referral data on the DGIS computer. The two required fields, Accession Number and Referral Name, will be enforced by the Input/Editing System. Referral records lacking entries in these fields will not be accepted into the Referral Directory.

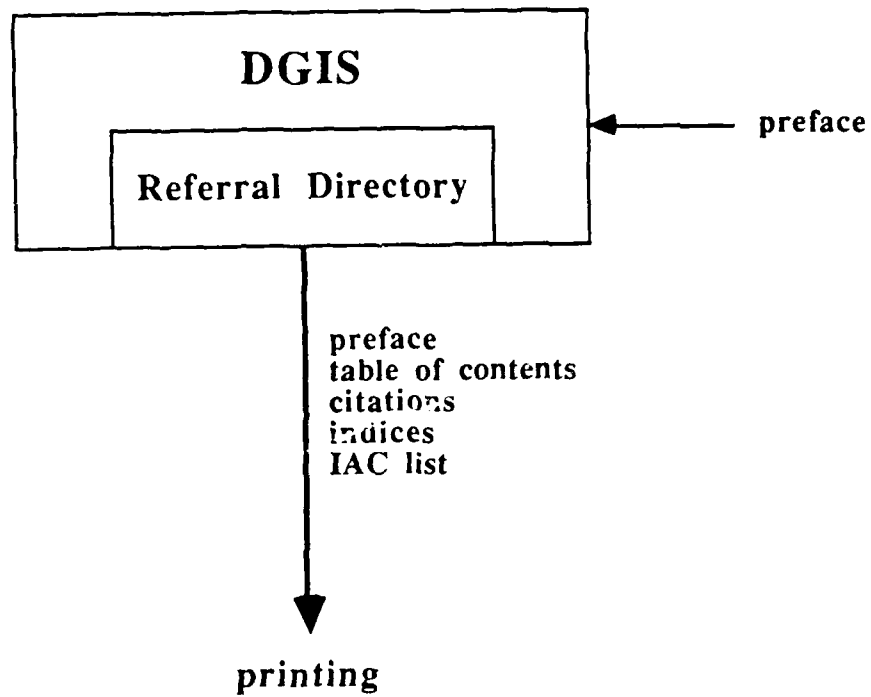


Figure 7. Procedures for Generation of Hardcopy Referral Directory.

4.2.6 Timing

Response time to queries is dependent on machine load. Most searches should complete within a few seconds. Response time for input/editing is more sensitive to machine load. Most inputs/updates should complete within a few minutes.

4.3 FLEXIBILITY

The Referral Directory is designed to provide flexible and responsive service to its users. Standard platforms and interfaces will be applied to develop the Referral Directory in a reliable and cost-effective manner. With support for these standards, the Referral Directory and its services can be ported, moved, distributed, modified, tuned, enhanced and/or shared with a nominal effort. Where support for these standard platforms and interfaces is lacking, the cost and time to perform the same work will increase.

The standard programming language is "C", with the intention of migrating to ANSI "C" as compilers and tools become available. All application-specific procedural programming will be done in "C" meeting this standard of portability or better. Parsing and query generation may be handled with 'lex' and 'yacc'; these tools will generate "C" meeting this standard of portability or better.

For non-procedural programming, the relational data model will define the standard data operations. Data types, access methods and data integrities will support the data elements and relationships described in Section 3.4, Data Characteristics. They will support the performance goals described in Section 4.2.6, Timing. For programming tools, the query language SQL will be supported; the query language QUEL may also be supported. For application development tools, these query languages will be embedded in "C" programs (ESQL, EQUQL). For user interfaces, the RTI INGRES forms system will be supported: fields, tablefields, menu items, menu key, etc. These forms constructs will also be available embedded in "C" programs. Programs built in this manner will behave similarly to RTI's supplied forms-based query tool QBF. Forms will be defined and customized with RTI's visual forms editor VIFRED.

The standard for the operating system is Berkeley 4.2 BSD UNIX or above, with the intention of supporting POSIX as POSIX-compliant application environments become available. All system support will be provided at this level or above. All system-specific tools and interfaces will be portable to any processor supporting this standard. Other operating systems such as VMS may be supported if development tools such as C and system calls defined by POSIX are supported, and if differences visible to production software are minor and compatible.

For networking, the current standard is TCP/IP with the intention of migrating to GOSIP interfaces and tools as they become available. All network access and distributed processing will execute over networks defined by the TCP/IP model. DECnet may be supported if differences in transport layer specifics are not visible to programming languages, application tools, or user interfaces. For local area networks the relevant standard is IEEE 802.1, commonly known as Ethernet. For internetwork access, the standards are those defined by ARPA and DDN.

For remote point-to-point access the standards are RS232 ASCII asynchronous transmission at 1200 and 2400 baud. The retrieval system will be designed to support this standard. For local use 9600 baud or higher will be supported over RS232 ASCII asynchronous interfaces or emulators. The input/editing system will be designed to support this standard.

For character-cell display devices the standard is any VDT that supports cursor addressing, effectively any ASCII asynchronous terminal for which a UNIX termcap entry can be written. In particular, termcap entries are already supported for ANSI terminals, a subset of VT100 capabilities, and VT100 emulators, a full set of capabilities emulated on a microcomputer or another terminal. For pointer-and-bitmap devices, the standard is the "X" windows network transparent programming interface, or emulation of supported character-cell display devices.

SECTION 5. ENVIRONMENT

5.1 EQUIPMENT ENVIRONMENT

The Referral Directory will reside on DTIC's DGIS computer (a Pyramid 98x). A modem, a terminal and an account on DGIS are needed to access the Referral Directory. To provide reliable service to users, a certain degree of hardware and operating system reliability and robustness is required of the host computer system. Adequate disk space, network access, backup services, processor availability and speed, and connectivity over government and commercial telecommunications services (DDN, TYMNET, modem pool and rotary) are also required. For smooth development, local network reliability and availability are also required.

Similar equipment is also acceptable. Section 4.3, Flexibility, provides a list of relevant standards which useful and productive systems meet.

5.2 SUPPORT SOFTWARE ENVIRONMENT

DGIS supports Berkeley UNIX 4.2 or higher (OSx version 4.4 or higher). A "C" language compiler and the RTI INGRES RDBMS version 5.0 are resident on DGIS. Thus, a host of software tools is available: 'awk', 'sed', 'grep', 'lex', 'yacc', RBF, report writer, SQL, OSL, GBF, EQUQL, ESQ, etc. These are the tools used for data loading, defining database integrities, generating and maintaining the user interface, providing remote interactive access, sharing update access safely and concurrently, providing fast search and display functions, and supporting heterogeneous hardware, operating system and network environments.

5.3 INTERFACE

The interface information available during the design phase is for general planning purposes and is not intended to be specific. Detailed interface information will be presented in the Referral Directory System Specification.

Context sensitive help will be provided from every screen.

5.4 SUMMARY OF IMPACTS

The proposed Referral Directory is expected to have the following impacts:

5.4.1 ADP Organization Impacts

Contract personnel currently working on the Referral Directory will maintain the same responsibilities. Once the product is operational, it will be turned over to DTIC for program management, operation and maintenance.

5.4.2 ADP Operational Impacts

User operations on the current Referral Directory will remain the same. Data editing will change from an offline process to an online process. The UNISYS 1100/82 on which the data currently reside will be updated from the Referral Directory on the DGIS computers via magnetic tape.

5.4.3 ADP Development Impacts

User development on the TR Database and Current File will remain the same.

5.5 FAILURE CONTINGENCIES

In case of failure of machine resources such as permanent storage, restore from backup will be effected. Alternatively, users may return to the hardcopy Referral Directory until recovery has occurred.

5.6 SECURITY

The Referral Directory is an unclassified system. It is not, however, open to the public. Access will be restricted to authorized users.

5.7 ASSUMPTIONS AND CONSTRAINTS

It is assumed that:

- a. The Referral Directory will be developed and maintained on the Pyramid 98x using Berkeley UNIX (OSx 4.4 or above) as an operating system, or that an equivalent Berkeley UNIX processor (4.2 BSD or above) will be provided for this purpose. For more specifics on the hardware environment see Section 5.1, Equipment Environment.
- b. Adequate equipment resources will be made available. Effective development will require at least 50 megabytes of disk space for sources, objects, images, forms, data, indices, and archives, and load averages of under 5 points of load on the Pyramid 98x.
- c. A licensed copy of RTI INGRES, version 5.0 or higher, will be made available on the development machine (Pyramid 98x or equivalent) to implement the Referral Directory. A reliable and current installation will be maintained by a local site representative. RTI software support services will be made available.
- d. The programming language "C" will be made available on the development machine.
- e. The data will be made available to the DGIS computer in ASCII format.
- f. The data will be made available to the UNISYS computer on magnetic tape at 1600 or 6250 bpi.

SECTION 6. COST FACTORS

DTIC-HDS and DTIC-FDRA staff will use ordinary VDT devices to input data into the Referral Directory, (see Section 3.3, Inputs-Outputs, and Section 4.3, Flexibility). A cost factor is procurement of an ASCII asynchronous VDT for use by DTIC-HDS staff, and connection of the VDT to the DGIS computer. This includes acquisition, placement, and setup of the VDT, and staff time to install the data communications, configure the port, and link the VDT into the network.

SECTION 7. SYSTEM DEVELOPMENT PLAN

DELIVERABLES	MILESTONES		STAFFING	
	<u>ESD</u>	<u>ECD</u>	<u>Data Tech</u>	<u>Anal</u>
PHASE I. Database of Databases				
a. Add capability to generate an individual record for a database for proofreading	7 Aug 89	14 Aug 89	0	32
b. Update of System Documentation to include generation of an individual record for proofreading, generation of address labels, generation of hardcopy Directory and connection to remote databases	31 Jul 89	7 Aug 89	0	40
c. Update of User Documentation to include generation of an individual record for proofreading, generation of address labels, generation of hardcopy Directory and connection to remote databases	31 Jul 89	7 Aug 89	0	48
d. Produce hardcopy Directory of DoD-Sponsored Databases with indices to page number, not accession number.	7 Aug 89	28 Aug 89	0	40
e. Demonstrate the address label generation capability for the Directory of DoD-Sponsored Databases	14 Aug 89	31 Aug 89	0	30
PHASE II. Referral Database				
a. Demonstrate the address label generation capability for the Referral Directory	21 Jul 89	28 Aug 89	0	4
b. Systems Specification for the Referral Database	7 Aug 89	4 Sep 89	20	48
c. Demonstrate the Retrieval System for the Referral Database	4 Sep 89	2 Oct 89	16	140
d. Demonstrate the Input System for the Referral Database	2 Oct 89	17 Nov 89	8	100
e. Demonstrate the Editing System for the Referral Database	17 Nov 89	13 Dec 89	8	180
f. Training on the Input, Edit and Retrieval Systems for Referral Database	13 Dec 89	5 Jan 90	0	40
g. System documentation for the Referral Database (including Input, Edit, Retrieval Systems; hardcopy generation; address label generation; generation of individual referral records for proofreading)	13 Dec 89	12 Jun 90	16	40
h. User documentation for the Referral Database (including Input, Edit, Retrieval Systems; hardcopy generation; address label generation; generation of individual referral records for proofreading)	13 Dec 89	22 Jan 90	16	56
		TOTAL	84	798

APPENDICES

APPENDIX A.

Project Implementation Plan for the DoD Gateway Information System (DGIS)
Directory of Resources

PROJECT IMPLEMENTATION PLAN (PIP)

1. TITLE

DoD Gateway Information System (DGIS) Directory of Resources
Office of Information Systems and Technology

2. SPONSOR

Defense Technical Information Center
Ms. Carol Jacobson (202) 274-7661
Technical Information Specialist

3. BACKGROUND

PHASE 1 - Database of Databases

This phase is a continuation of the PIP entitled DoD Gateway Information System (DGIS) Directory of Resources. It addresses the steps that need to be taken to complete the database portion of the Directory of Resources.

The database of databases was moved from the VAX 11/780 to the Pyramid using the INGRES database management system. Several prototype versions of the database were designed, tested, and modified. Version 2.6 of the database of databases became operational on 1 October 1988.

A second edition of the Directory of DoD-Sponsored R&D Databases was produced and distributed to several hundred organizations. The Directory is in its second printing and is one of DTIC's best sellers.

PHASE II -- Referral Database

DTIC has been providing referral services for over 20 years. A program for a centralized directory and referral service began in the early 1960's. Today, DTIC's referral services consist of responding to telephone and written inquiries, providing a data bank of referral citations, and printing and distributing a directory of these citations.

The Referral Data Bank currently resides on DTIC's UNISYS 1100/82 computer as part of the Technical Reports (TR) Database. Each record contains an accession number, a referral name, a referral address, referral telephone numbers (commercial and AUTO-VON), referral point-of-contact, an organization name, information regarding access and charges, a description of the collection, a description of the publications provided by the organization, the services and materials provided by the organization, and an annotation. Referral records can be retrieved during a search of the TR Database. These records are not displayable online, but can be displayed offline if the user requests a print of the search results. Referral records also appear in demand bibliographies. A hard copy directory is generated from the Referral Data Bank.

The Referral Data Bank Directory was first printed and distributed in October 1970. Since that time eight editions of the Directory have been published, the most recent of which was printed and distributed in February 1984.

4. OBJECTIVE

PHASE I - Database of Databases

The objective is to incorporate additional features into the online database of databases of interest to the DoD R&D community, and to provide appropriate training and retrieval.

PHASE II - Referral Database

The objective is to develop an online database of information centers which will be part of DGIS the Directory of Resources and to produce a hard copy Referral Directory.

5. TECHNICAL APPROACH

PHASE I - Database of Databases

The database of databases was moved from prototype to production use on 1 Oct 88. Completion of this phase requires written documentation and user training regarding applications built for the database of databases. In addition, enhancements to the applications will be implemented and documented.

A final report on the benchmark test and a final report on analysis of the feasibility of connecting to databases from the Directory will be delivered. The documentation will be updated to include several new features: generation of an individual record for proofreading, generation of address labels for organizations, and turnkey generation of a complete new hard copy Directory. Documentation will also be updated to include connecting from the Directory to remote databases. Separate user and system documentation will be provided.

Training on the input system will be provided for the DTIC staff who will maintain the Directory (add new databases, remove databases no longer extant, and update information about extant databases).

Enhancements to be added include generation of an individual record for proofreading, generation of address labels for organizations, turnkey generation of a complete new hard copy Directory, and modifying the generation of the hardcopy Directory of DoD-Sponsored Databases to produce indices to page number instead of accession number.

PHASE II -- Referral Database

The technical approach will consist of the preparation of a functional specification of the Referral Database (as part of the Directory of Resources). The functional specification will include a description of the enhanced capabilities afforded by providing the Referral Database as part of the Directory of Resources. The functional specification will be prepared in accordance with the Life Cycle Management format, and it will require approval by the DTIC project Officer.

After the functional specification is accepted, a detailed system specification will be prepared. The system specification will include a description of the desired database design; screen layouts; reports; and display formats. The system specification will be prepared in accordance with the Life Cycle Management format, and it will require approval by the DTIC project Officer.

The database structure will be designed and developed using the INGRES database management system on the Pyramid 98x minicomputer. Procedures for the batch input of data from the Referral Data Bank will be developed. DTIC will provide a magnetic tape with the records from the Referral Data Bank. The data will be uploaded and incorporated into the Referral Database on the Pyramid 98x. Data conversion will be accomplished prior to testing if necessary. A demonstration of the initial prototype will be provided for the project officer and DTIC-F staff.

A retrieval system suitable for end users will be built. It will allow searching the Referral Directory by subject area, Referral Name, and point of contact. The user will be able to display search results online in a brief or full format.

The final stage of the prototype will include the testing and evaluation of the database. Complete user and system documentation for use during prototype test and evaluation will be prepared. Selected DTIC staff will be trained in input and retrieval. After the prototype test, a complete written evaluation, including recommendations for changes to the prototype will be submitted for approval to the DTIC project officer.

APPENDIX B.

**Standard Operating Procedures for Referral Data Bank
Output**

STANDARD OPERATING PROCEDURES <small>For DTIC PRODUCTS AND SERVICES</small>		DTICR 5025.3				
MAJOR FUNCTION: Referral Data Bank	OPI: DTIC-FDR	SECTION: 9B				
OPERATION: Referral Output	SUPERSEDES <small>(No. & Date):</small> 9B 18 Jul 84	PAGE NO: ____ of ____				
<p>A. <u>Purpose</u>. Establish a procedure for identifying sources in response to requests for STINFO.</p> <p>B. <u>Involved Organizations</u>.</p> <p style="margin-left: 40px;"><u>DTIC-FDR</u></p> <p style="margin-left: 40px;"><u>1-7</u></p> <p>C. <u>Activity</u>.</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left; width: 35%;"><u>Responsibility</u></th> <th style="text-align: left;"><u>Action</u></th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">DTIC-FDR</td> <td> <ol style="list-style-type: none"> 1. Receive by telephone, letter or in person, inquiries for information on sources of specialized subject areas. 2. Analyze queries to specify subject areas of information requested and action required. 3. Review Referral Data Bank Directory to identify possible sources. 4. Search Defense RDT&E Online System (DROLS) to locate activities specializing in the requested subject area. If needed order bibliography of reports of organizations working in the subject field. 5. Review computer printouts to determine pertinence of specialized sources. 6. Search available directories and other listings of sources outside of the Referral Data Bank. Verify accuracy of information by telephone (local or AUTOVON). </td> </tr> </tbody> </table>			<u>Responsibility</u>	<u>Action</u>	DTIC-FDR	<ol style="list-style-type: none"> 1. Receive by telephone, letter or in person, inquiries for information on sources of specialized subject areas. 2. Analyze queries to specify subject areas of information requested and action required. 3. Review Referral Data Bank Directory to identify possible sources. 4. Search Defense RDT&E Online System (DROLS) to locate activities specializing in the requested subject area. If needed order bibliography of reports of organizations working in the subject field. 5. Review computer printouts to determine pertinence of specialized sources. 6. Search available directories and other listings of sources outside of the Referral Data Bank. Verify accuracy of information by telephone (local or AUTOVON).
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APPROVED	DATE					

STANDARD OPERATING PROCEDURES

For DTIC PRODUCTS AND SERVICES

DTICR
5025.5

MAJOR FUNCTION: Referral Data Bank	OPI: DTIC-FDR	SECTION: 9B
OPERATION: Referral Output	SUPERSEDES (No. & Date): 9B 18 Jul 84	PAGE NO: ____ of ____
<p>7. Reply requester, including precise source information (address, key personnel and telephone numbers). Include information on Referral Data Bank Directory for future requests.</p>		
APPROVED	DATE	

APPENDIX C.

Standard Operating Procedures for Referral Data Bank Input



STANDARD OPERATING PROCEDURES
For DTIC PRODUCTS AND SERVICES

DTICR
5025.5

MAJOR FUNCTION: Referral Data Bank	OPI: DTIC-FDR	SECTION: 9A
OPERATION: Referral Input	SUPERSEDES (No. & Date): 9A 10 Sep 84	PAGE NO: _____ of _____

A. Purpose. Establish a procedure for the identification, acquisition, analysis, review, indexing and control of STINFO data for inclusion in the Referral Data Bank.

B. Involved Organizations.

<u>DTIC-FDR</u>	<u>DTIC-HDS</u>	<u>DTIC-HDB</u>
1-8	9	10
	11-13	
14-18	19-21	
22		

C. Activity.

Responsibility

Action

DTIC-FDR

1. Identify STINFO activities, mainly through use of the written media (e.g., military directories, COSATI directories, newsletters, RDT&E information, other published research information). Activities include information analysis centers, information centers, data centers, technical libraries, technical information branches, special information projects, laboratories testing directories etc.

2. Solicit and Acquire data:

a. Contact activity by letter or telephone to explain the DTIC referral program and determine if qualified and interested.

APPROVED	DATE
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STANDARD OPERATING PROCEDURES
For DTIC PRODUCTS AND SERVICES

DTICR
5025.5

MAJOR FUNCTION: Referral Data Bank	OPI: DTIC-FDR	SECTION: 9A
OPERATION: Referral Input	SUPERSEDES (No. & Date): 9A 10 Sep 84	PAGE NO: ____ of ____

4. Send activity one copy of completed DTIC Form 91 for final review and verification with any needed explanations of the terms used.

5. File one copy of DTIC Form 91 in suspense.

6. Receive back from activity the DTIC Form 91 with comments.

7. Note comments made by activity and, if acceptable, make appropriate changes. Give activity the reason if their suggestions are not adopted.

8. Forward DTIC Form 91 to DTIC-HDS for input into automated system.

DTIC-HDS

9. Forward DTIC Form 91 to DTIC-HDB for source code assignment.

DTIC-HDB

10. Assign source code and return DTIC Form 91 to DTIC-HDS.

DTIC-HDS

11. Type DTIC Form 91 data on RTIS; FLAG computer for application to direct file.

12. Receive print R&E (Right & Error-EAB40PR & EAB40PE) from DTIC-ZOS.

13. Forward DTIC Form 91 and print R&E to DTIC-FDR.

APPROVED 	DATE
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APPENDIX D.

**Letter of Solicitation
to Potential Referral Activities**



DEFENSE LOGISTICS AGENCY
DEFENSE TECHNICAL INFORMATION CENTER
CAMERON STATION
ALEXANDRIA, VIRGINIA 22311

DTIC-DDR

SUBJECT: DTIC Referral Data Bank Directory

13 JUL 1984

TO: Librarian
Bureau of Labor Statistics
U.S. Department of Labor
Office of Publications
Washington, D.C. 20212

1. The Defense Technical Information Center maintains and publishes a Referral Data Bank Directory to assist the Defense scientific and technical community in identifying central sources of specialized research information. This directory lists Scientific and Technical Information (STI) sources with their specialized subject areas and includes organizations operated or supported by DoD or other Federal Agencies, such as specialized libraries, data banks, repositories, laboratories, testing facilities, information centers, and research facilities. This referral information is also included in our automated retrieval system for subject bibliographic searches by our users who can then contact the source direct for needed information on a given subject.
2. We are looking for substantive STI sources to include in this Directory and would like to add your activity if you feel it would contribute to serving the needs of the Defense STI community. If so, please complete the attached form, providing sufficient detail on your activity, services, specialized subject areas, and use-limitations, and forward to The Administrator, Defense Technical Information Center, ATTN: DTIC-DDR, Cameron Station, Alexandria, Virginia 22314. Please include any flyers or brochures about your activity.
3. This Directory will be reissued in 1984 and we hope to include your activity. For further information please contact my office, (202)274-6904, Autovon (202)284-6904.

Sincerely,

Margaret Mullen for

HAZEL T. HORTON
Chief, Reference
Services Branch

2 Encl

1. DDC Form 91
2. Explanation of
Fields on Referral
Data Worksheet



APPENDIX E.

Referral Data Work Sheet

REFERRAL DATA WORK SHEET

UNCLASSIFIED

1 REFERRAL NO.

2 NAME OF ACTIVITY:

6 ADDRESS (In Detail)

TELEPHONE: AC
AV:

PTS:

23 SUBJECT TERMS/KEYWORDS

10 HEAD (Name & title)

A CONTACT POINT (Name & title)

B ALTERNATE CONTACT (Name & title)

C MONITORING OFFICER (Applies Only to Contractors)

11 DATE OF INFO

12 1

14 CONTROLLING DEPT/AGENCY

TYPE OF ORGANIZATION

15 CONTRACT NO. (For Contractors)

☐ SEE BACK16 LANGUAGES
(Used in Indexing)17 LANGUAGES
(Used in Indexing)18 LANGUAGES
(Used in Indexing)

25 INFORMATION SERVICES/MATERIALS

19 DATES COVERED IN COLLECTION

20 DOC. CLASS.
U21 DESCRIPTION AND APPROXIMATE SIZE OF COLLECTION,
INCLUDING ANY SPECIAL COLLECTIONS (Use up to 800
Characters)☐ SEE BACK22 USER QUALIFICATIONS & ACCESS LIMITATIONS
(Indicate any Service Charges) (Use up to 400 Characters)☐ SEE BACK☐ SEE BACK27 PUBLICATIONS ISSUED (Give Sales/Distribution
Points; Use up to 1800 Characters)

30 MISSION, CHIEF PROGRAMS (Use up to 450 Characters)

☐ SEE BACK☐ SEE BACK

33 DISTR/AVAILABILITY CODE

34 GEOGRAPHIC CODE

35 QA CODE

DTIC FORM 91
OCT 81UNCLASSIFIED
CLASSIFICATION OF WORKSHEET

PREVIOUS EDITIONS ARE OBSOLETE

APPENDIX F.

Referral Questionnaire (Example)

**Defense Technical Information Center
Referral Questionnaire**

Organization Name _____

Organization Address _____

Point(s) of Contact _____

nametitle

nametitle

Telephone _____

commercialAUTOVON

FTSFAX

Government Affiliation *The Federal Department with which your activity is currently affiliated*
Check exactly one

☐ Army

☐ Navy

☐ Air Force

☐ DoD

☐ Other (specify) _____

Organization type *Check exactly one*

☐ Academic Library

☐ Medical Library

☐ IAC

☐ Research Laboratory

☐ Library

☐ Technical Library

☐ Other (specify) _____

Contract Number _____

Languages *Check all that apply*

☐ Chinese

☐ German

☐ Russian

☐ Dutch

☐ Italian

☐ Spanish

☐ French

☐ Japanese

☐ Other (specify) _____

Coverage _____ to present
date

Collection *Check all that apply and enter number of items as appropriate*

_____ abstract journals	_____ photographs
_____ announcement bulletins	_____ pictorial data
_____ books	_____ preprints
_____ classified materials	_____ reprints
_____ computer software	_____ scientific and technical data sets
_____ government reports	_____ technical reports
_____ journals/serials/periodicals	_____ translations
_____ maps	_____ unpublished materials
_____ microforms	_____ video cassettes
_____ phonograph records or audio tapes	

Other (specify)

_____	number	_____	type
_____	number	_____	type
_____	number	_____	type
_____	number	_____	type

Online systems *check all that apply*

<input type="checkbox"/> BRS	<input type="checkbox"/> DROLS	<input type="checkbox"/> OCLC
<input type="checkbox"/> DIALOG	<input type="checkbox"/> MEDLARS	<input type="checkbox"/> ORBIT
<input type="checkbox"/> DoE Recon	<input type="checkbox"/> NASA Recon	<input type="checkbox"/> RLIN
<input type="checkbox"/> other (specify) _____		

Hours of Operation _____

Access *Check exactly one*

- | | |
|--|--|
| <input type="checkbox"/> DoD only | <input type="checkbox"/> DoD and contractors |
| <input type="checkbox"/> U.S. government only | <input type="checkbox"/> U.S. government and contractors |
| <input type="checkbox"/> Unlimited -- open to public | |
| <input type="checkbox"/> Other (specify) _____ | |

Charges ☐ no charge

- ☐ charge _____
(access fees, processing fees, special service fees, etc.)

Descriptors

_____	_____
descriptor	descriptor
_____	_____
descriptor	descriptor
_____	_____
descriptor	descriptor
_____	_____
descriptor	descriptor
_____	_____
descriptor	descriptor

Services *Check and fill in all that apply*

- | | |
|---|--|
| <input type="checkbox"/> bibliography compilation | <input type="checkbox"/> online searches |
| <input type="checkbox"/> consultant | <input type="checkbox"/> reference |
| <input type="checkbox"/> data compilation | <input type="checkbox"/> referral |
| <input type="checkbox"/> identification | <input type="checkbox"/> state-of-the-art reviews |
| <input type="checkbox"/> literature searches | <input type="checkbox"/> technical analysis and evaluation |
| <input type="checkbox"/> loans (interlibrary) | <input type="checkbox"/> technical answers |
| <input type="checkbox"/> manual searches | |

Other services (specify):

service

service

service

Publications

type / title

type / title

type / title

type / title

type / title

type / title

type / title

Annotation

Briefly describe the activity

APPENDIX G.

TR Database Fields Used by Referral Activities

TR Database Fields used by Referral Activities

TR field	Length	Description	Referral use
1	9	DTIC Accession Number	Accession Number
2	450	Fields and Groups	N/A
3	1	Entry Classification	always "U"
4	12	NTIS Prices	N/A
5	116	Source Name	Activity Name
6	450	Unclassified Report Title	Address and Phone Numbers: Commercial, AUTOVON, FAX, and FTS
7	450	Classified Report Title	N/A
8	1	Report Title Classification	always "U"
9	120	Descriptive Note	N/A
10	620	Personal Authors	Points of Contact
11	24	Report Date	Date of Last Update
12	8	Pagination	N/A
13	0	Blank Field	N/A
14	70	Source Report Series Number	Organization Type (Service, Function)
15	70	Contract or Grant Number	Contract Number
16	70	Project Number	Languages
17	70	Task Number	Languages
18	24	Monitor Acronym	Coverage
19	32	Monitor Series Number	N/A
20	1	Report Classification	always "U"
21	600	Supplementary Note	Collection
22	400	Distribution Availability Statements	Access and Charges
23	1200	Posting Terms	Descriptors
24	1	Posting Terms Classification	always "U"
25	1200	Candidate Posting Terms	Services
26	1	Candidate Posting Terms Classification	always "U"
27	1800	Abstract	Publications
28	1	Abstract Classification	always "U"
29	4	Initial Inventory	N/A
30	450	Index Annotation	Referral Annotation
31	1	Circle Special Indicator Codes	N/A
32	10	Circle Security Group Number	N/A
33	10	Limitation/Availability Codes	N/A